Washington State Department of Transportation

Hood Canal Bridge East-half Replacement and West-half Retrofit Project

Pontoon Removal and Replacement Facts

GET READY 5/2009

Why are the pontoons being replaced?
The original east-half pontoons, superstructure and draw span assembly of the SR 104 Hood Canal Bridge have been subjected to the harsh marine environment since the bridge opened Aug. 12, 1961. Decades of wind, waves and saltwater have worn the bridge down. The new east-half pontoons are designed to last **75 years.** They feature a wider, safer roadway and more reliable electrical, mechanical and hydraulic systems.

The existing **11** east-half pontoons will be removed in **four sections** (including the draw span). Some of the pontoon sections being removed and replaced are more than **300 yards long** – roughly the length of **three football fields.**

Sequence of existing pontoon sections being removed
1. 471-foot draw span pontoons MM and M
2. 928-foot flanking pontoons N, O and P
3. 720-foot roadway pontoons Q and R
4. 770-foot roadway pontoons S, T, U and V

How the pontoons will be removed:
- To separate the pontoons, **80 bolts** measuring **1.5 inches** in diameter must be removed and **24 steel tendons** must be cut
- High strength steel rods are then installed to temporarily keep the pontoons together
- **Four wedges** will be installed – one at each corner – to keep the pontoons slightly separated and allow cutting equipment to reach the tendons
- **Three saws** will be set up on the pontoon deck and cut away about one-third of the pontoon. The heavy duty saw will use diamond-embedded steel cable, which will be fed through vertical holes in the deck. Divers will then bring the end of the cable back to the saw to form a complete loop. Once a loop is formed, water is pumped to the saw to keep the wire lubricated and cutting begins.
- Once cutting is complete, remove rods and wedges
- The pontoon sections will then be towed away by tugboats

The **17** new east-half pontoons will be replaced in **three** sections from east to west, starting with the two roadway pontoon sections and finishing with the new draw span assembly. Prior to joining, the pontoons were properly ballasted – which was achieved by adding and removing weight from the pontoons to change their height in the water – to ensure proper alignment. This is essential because the roadways on each of the new pontoon sections must be accurate to within **one-eight inch** – approximately the width of the **two stacked pennies** – for every **10 feet** of surface.

Sequence of pontoon sections being installed:
1. 943-foot roadway pontoons U, V, W and X
2. 900-foot retrofitted pontoons R, S and T
3. 596-foot, U-shaped draw span assembly pontoons PA, PB, Q, NA and NB (pontoons YD, YE, and YF are underwater and support the draw span assembly), and the 495-foot draw span pontoon ZC/ZD

How the pontoons will be joined
- Place a rubber seal around the joint where the pontoons meet to keep water out
- Clean and prepare the pontoon ends
- Align the pontoons by using surveying equipment to ensure they can be mated properly
- Bring the pontoons together using jacks to line up the mating keys, splice tendons, piping and electrical conduit
- Install temporary stressing strands and pull tight to hold pontoons in place. Pump all water out of the joint and check alignment. Install blockouts to keep the permanent tendons clear and grout joint.
- Install remaining tendon and complete post-tensioning. Grout tendons.

Learn how the pontoons were constructed at www.HoodCanalBridge.com

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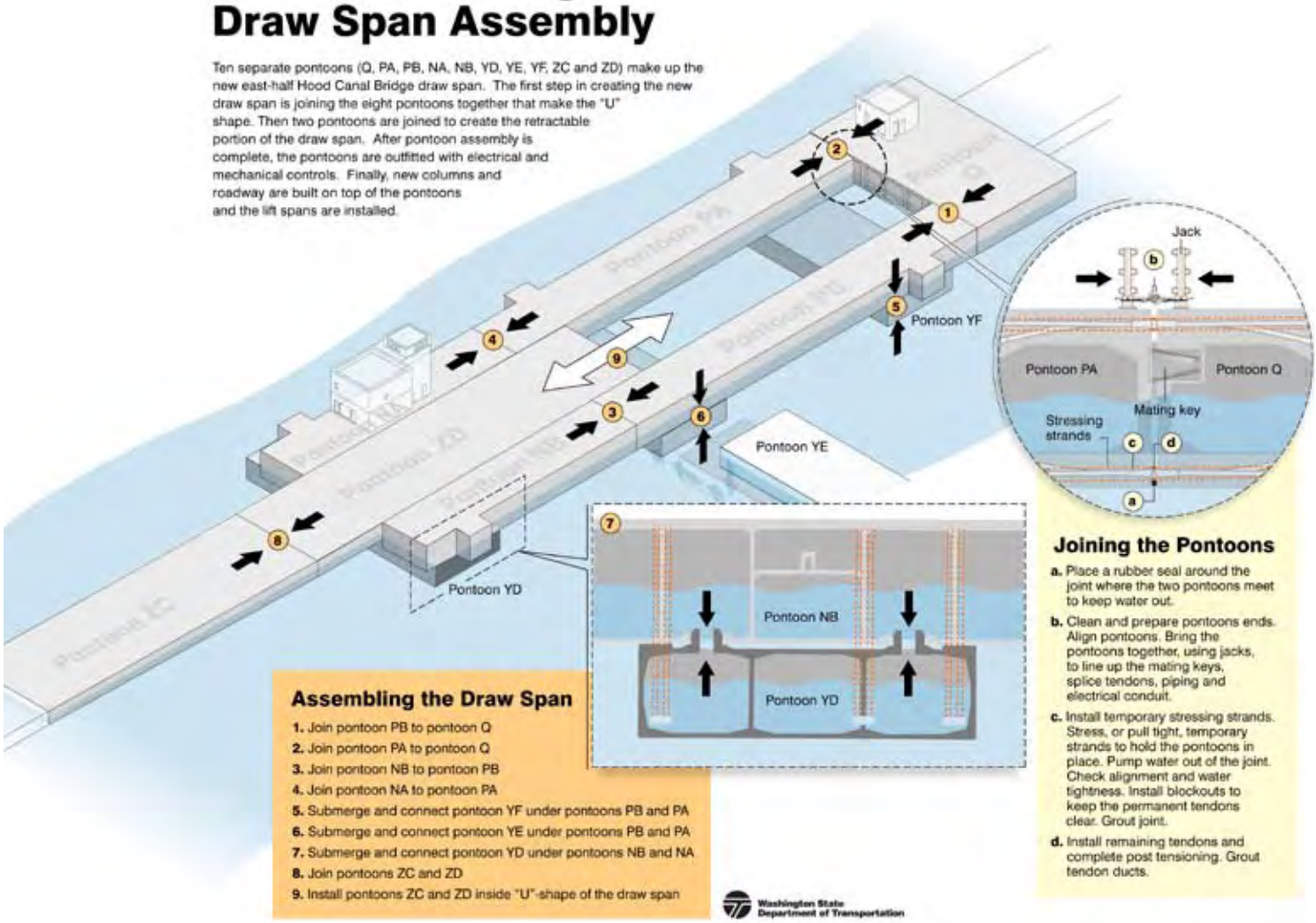
Hood Canal Bridge
Draw Span Assembly

Ten separate pontoons (Q, PA, PB, NA, NB, YD, YE, YF, ZC and ZD) make up the new east-half Hood Canal Bridge draw span. The first step in creating the new draw span is joining the eight pontoons together that make the "U" shape. Then two pontoons are joined to create the retractable portion of the draw span. After pontoon assembly is complete, the pontoons are outfitted with electrical and mechanical controls. Finally, new columns and roadway are built on top of the pontoons and the lift spans are installed.



Assembling the Draw Span

1. Join pontoon PB to pontoon Q
2. Join pontoon PA to pontoon Q
3. Join pontoon NB to pontoon PB
4. Join pontoon NA to pontoon PA
5. Submerge and connect pontoon YF under pontoons PB and PA
6. Submerge and connect pontoon YE under pontoons PB and PA
7. Submerge and connect pontoon YD under pontoons NB and NA
8. Join pontoons ZC and ZD
9. Install pontoons ZC and ZD inside "U"-shape of the draw span

Joining the Pontoons

a. Place a rubber seal around the joint where the two pontoons meet to keep water out.

b. Clean and prepare pontoons ends. Align pontoons. Bring the pontoons together, using jacks, to line up the mating keys, splice tendons, piping and electrical conduit.

c. Install temporary stressing strands. Stress, or pull tight, temporary strands to hold the pontoons in place. Pump water out of the joint. Check alignment and water tightness. Install blockouts to keep the permanent tendons clear. Grout joint.

d. Install remaining tendons and complete post tensioning. Grout tendon ducts.

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